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Observations of two of the Satellites of Saturn, and of the Exterior Diameter of the Exterior Ring, made at Valetta. By Mr. Lassell.

Observations of Hyperion.

1852.	G.M.T. h m				″				″
Nov. 1	10 50	precedes	Saturn's	centre	225·0	South	of Saturn's	centre	52·9
2	10 54	—	—	—	190·0	—	—	—	67·8
3	11 18	—	—	—	134·8	—	—	—	85·3
4	12 52	—	—	—	81·9	—	—	—	92·0
5	10 31	—	—	—	19·6	—	—	—	97·7
6	11 17	follows	—	—	46·3	—	—	—	92·2
10	11 32	—	—	—	248·9	—	—	—	32·7
11	11 9	—	—	—	258·7	—	—	—	8·5
12	10 54	—	—	—	250·4	North	—	—	18·2
13	10 11	—	—	—	224·4	—	—	—	38·2
15	11 9	—	—	—	101·8	—	—	—	71·6
16	10 11	—	—	—	23·9	—	—	—	75·3
18	10 16	precedes	—	—	132·0	—	—	—	55·4
19	10 17	—	—	—	196·2	—	—	—	37·0
20	10 21	—	—	—	230·7	—	—	—	13·4
27	10 18	follows	—	—	32·6	South	—	—	89·8
29	10 1	—	—	—	154·6	—	—	—	75·3
Dec. 2	8 49	—	—	—	252·6	—	—	—	18·0
3	9 51	—	—	—	256·7	North	—	—	8·0
9	11 15	precedes	—	—	111·6	—	—	—	58·0
13	10 12	—	—	—	225·8	South	—	—	31·8
15	9 29	—	—	—	165·7	—	—	—	67·3
20	8 26	follows	—	—	127·5	—	—	—	74·7
27	8 0	—	—	—	150·5	North	—	—	59·5
1853.									
Jan. 7	8 22	precedes	—	—	75·2	South	—	—	80·5
8	8 18	—	—	—	16·5	—	—	—	87·2
12	7 11	follows	—	—	194·3	—	—	—	53·8
14	6 39	—	—	—	242·7	—	—	—	15·4
15	5 43	—	—	—	242·1	North	—	—	13·3
17	5 57	—	—	—	169·2	—	—	—	50·1

Period deduced from five observations in 1850, compared with the above, 21·297 days.

A rather large ellipticity of orbit is shown by the above observations.

Observations of Japetus.

1852.	G.M.T. h m				″				″
Oct. 30	11 18	precedes	Saturn's	centre	293	South	of Saturn's	centre	206
Nov. 1	10 50	—	—	—	195	—	—	—	195
3	10 54	—	—	—	119	—	—	—	195
Nov. 5	10 31	—	—	—	19·6	—	—	—	169·8

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1852.	G.M.T. h m		″		″
Nov. 6	11 30	follows Saturn's centre	46·3	South of Saturn's centre	159·6
10	11 32	— — —	217·6	— — —	106·0
11	11 9	— — —	261·5	— — —	89·5
13	10 11	— — —	343·9	— — —	59·1
15	11 30	— — —	409·6	— — —	25·4
16	10 31	— — —	447·4	— — —	7·6
18	10 25	— — —	507·6	North — —	26·7
19	10 27	— — —	517·9	— — —	46·4
20	10 36	— — —	551·2	— — —	68·3
27	10 33	— — —	589·3	— — —	163·2
29	10 39	— — —	568·9	— — —	186·5
Dec. 3	10 6	— — —	485·8	— — —	217·4
13	10 18	— — —	113·8	— — —	195·4
15	9 29	— — —	28·8	— — —	175·7
27	8 30	precedes — —	431·7	— — —	6·5

Measures of the Exterior Diameter of the Exterior Ring of Saturn and of the Polar and Equatoreal Diameters of his Disk.

Diameter of Ring.					Equatoreal Diameter.				
1852.	″	No.	Power.	Reduced to Mean Dist. ″	1852.	″	No.	Power.	Reduced to Mean Dist. ″
Nov. 18	47·4	6	614	40·694	Nov. 19	20·96	3	...	17·990
19	47·14	4	...	40·490	29	20·94	8	...	18·107
29	47·59	7	...	41·152	Dec. 3	19·03	6	...	16·515
Dec. 3	46·70	8	...	40·529	20	20·01	6	...	17·732
20	46·32	5	614	41·046	22	19·29	10	760	17·143
24	45·66	6	760	40·580	24	19·53	7	760	17·409
27	45·55	7	614	40·794	27	19·29	2	614	17·276
			Mean =	40·881				Mean =	17·453

Polar Diameter.

1852.	″	No.	Power.
Nov. 29	19·14	10	...
Dec. 3	17·86	5	...
20	17·67	5	...
22	18·45	9	760
24	17·90	6	760

"The measures of the 3d December were taken under the especial determination *not to be in excess*, and probably I should otherwise have taken them somewhat larger. In several instances I have omitted to record the power, but I presume it would be 760, which I most frequently use when the air is in an average state. Comparing the mean of the five measures of polar diameter with the mean of those taken of the equatoreal diameter on the same days, $e = 0{\cdot}078764$, or $\frac{1}{12{\cdot}697}$, *i.e.* the apparent ellipticity, without applying the correction for the present inclination of the axis.

"The measures of the equatoreal diameter and major axis of ring differ considerably from those obtained by Professor Struve at Dorpat. With respect to the ellipticity, I would remark that, without a *perfect* driving motion, it is impossible to measure both diameters of the disk under equal circumstances.

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